targeting groups (labile or otherwise) could also be attached to the prodrug to enhance the delivery process.

In a first aspect, the present invention provides a prodrug of the general Formula (I), (II) or (III):

(I)

(II)

(III)

in which

X and X' are either the same or different and are pharmaceutically active moieties;

L is a linker group; and

Y is a pharmacokinetic regulator,

or a pharmaceutically acceptable derivative or salt thereof.

In a second aspect, the present invention provides a method for the preparation of the prodrug as defined above which comprises the steps of:

(a) optionally protecting the pharmaceutically active moieties X and/or X' and/or the linker group which is attached to the optionally protected pharmacokinetic regulator Y;

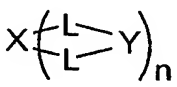
(b) reacting the optionally protected pharmaceutically active moieties X and/or X' and the optionally protected linker group L attached to the optionally protected pharmacokinetic regulator Y; and

(c) if necessary, removing the protecting groups of the pharmaceutically active moieties X and/or X', the linker L and the pharmacokinetic regulator Y.

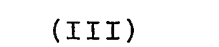
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A prodrug of the general Formula (I), (II) or (III):

(I)



(II)



(III)

in which

X and X' are either the same or different and are pharmaceutically active moieties;

L is a linker group; and

Y is a pharmacokinetic regulator,

or a pharmaceutically acceptable derivative or salt thereof.

2. A prodrug according to claim 1, in which the pharmaceutically-active moieties X and Y are selected from synthetic or natural peptides, proteins, mono- or oligosaccharides, sugar-amino acid conjugates, sugar-peptide conjugates, toxins, drugs, pro-drugs or drug like molecules.

3. A prodrug according to claim 1 or claim 2, in which the pharmaceutically active moiety is an antimicrobial or antiinfective agent.

4. A prodrug according to claim 3, in which the antimicrobial or antiinfective agent is an antibacterial agent, antifungal agent, antiparasitic agent, antimycotic agent or antiviral agent.

5. A prodrug according to claim 4, in which the antibacterial agent is an aminoglycoside, beta-lactam antibiotic, vancomycin or ciprofloxacin.

6. A prodrug according to claim 5, in which the aminoglycoside is selected from tobramycin, kanamycin A to C, amikacin, neomycin, streptomycin, neamine, paromomycin, lividomycin, 2230-C, ribostamycin, xyllostasin, butirosin, 4'-deoxybutyrosin, LL-BM408a, gentamycins and nebramycin.

7. A prodrug according to claim 5 or claim 6, in which the aminoglycoside is tobramycin, amikacin, neomycin or kanamycin.

8. A prodrug according to any one of claims 5 to 7, in which the aminoglycoside is tobramycin.

9. A prodrug according to claim 4, in which the antiviral agent is a nucleoside, rhinovirus capsid-binding compound, antisense oligonucleotide, peptide, an inhibitor of HIVRT or an inhibitor of influenza neuraminidase.

10. A prodrug according to claim 4, in which the antifungal agent is amphotericin β or an azole.

11. A prodrug according to claim 4, in which the antiparasitic agent is an aspartic proteinase.

12. A prodrug according to any one of the preceding claims, in which the linker group is selected from esters, amides, ureas, thioureas, imines, acetals, ethers, phosphates, phosphate esters or diesters, thioesters, oximes and hydrazones.

13. A prodrug according to claim 12, in which the linker group is selected from an ester, amide, oxime and phosphate.

14. A prodrug according to claim 12 or claim 13, in which the linker group is an ester.

15. A prodrug according to any one of the preceding claims, in which the pharmacokinetic regulator is a hydrophobic or hydrophilic moiety.

16. A prodrug according to claim 15, in which the hydrophobic moiety is an optionally substituted straight chain, branched and/or cyclic saturated or unsaturated hydrocarbon.

17. A prodrug according to claim 16, in which the hydrophobic moiety is an optionally substituted alkyl or optionally substituted alkenyl having 1 to 24 carbon atoms which is optionally interrupted with oxygen or nitrogen; optionally substituted aryl; or an optionally substituted heterocyclyl.

18. A prodrug according to claim 17, in which the optionally substituted alkyl or optionally substituted alkenyl is optionally substituted C_{1-20} alkyl or optionally substituted C_{2-20} alkenyl which is optionally interrupted with O, C=O, NH, optionally substituted aryl or optionally substituted heterocyclyl and optionally substituted with carboxyl, optionally substituted C_{1-6} alkyl, amino or hydroxyl.

19. A prodrug according to claim 17, in which the optionally substituted aryl is an optionally substituted phenyl or optionally substituted biphenyl.

20. A prodrug according to claim 17, in which the optionally substituted heterocyclyl is a 5- or 6-membered nitrogen containing heterocyclic group.

21. A prodrug according to claim 20, in which the heterocyclic group is selected from pyridyl, indolyl,

indazolyl, 2,3-dihydro-1H-indolyl, furanyl, isoxazolyl, pyrazolyl and thiofuranyl.

22. A prodrug according to any one of claims 19 to 21, in which the optional substituents on the phenyl or heterocyclyl are selected from halo, C_{1-4} alkyl, C_{1-4} alkoxy, hydroxy and OCF_3.

23. A method for the preparation of the prodrug as defined in any one of claims 1 to 22, which comprises the steps of:

(a) optionally protecting the pharmaceutically active moieties X and/or X' and/or the linker group which is attached to the optionally protected pharmacokinetic regulator Y;

(b) reacting the optionally protected pharmaceutically active moieties X and/or X' and the optionally protected linker group L attached to the optionally protected pharmacokinetic regulator Y; and

(c) if necessary, removing the protecting groups of the pharmaceutically active moieties X and/or X', the linker L and the pharmacokinetic regulator Y.

24. A pharmaceutical formulation comprising the prodrug as defined in any one of claims 1 to 22 or a pharmaceutically acceptable salt or derivative thereof, together with one or more pharmaceutically acceptable carriers.

25. A pharmaceutical formulation according to claim 24, which further comprises one or more other therapeutic and/or prophylactic ingredients.

26. A pharmaceutical formulation according to claim 25, in which the other therapeutic and/or prophylactic ingredient is an antimicrobial or antiinfective agent.

27. A pharmaceutical formulation according to claim 26, in which the antiinfective agent is an antibacterial agent.

28. A pharmaceutical formulation according to claim 27, in which the antibacterial agent is used to treat respiratory infections.

29. A pharmaceutical formulation according to claim 27 or claim 28, in which the antibacterial agent is a combination of trimethoprim and sulfonamide; bacitracin and polymyxin B-neomycin; imipenem and fluoroquinolone; and beta-lactam and aminoglycosides.

30. An inhaler which comprises a prodrug as defined in any one of claims 1 to 22 or a formulation as defined in any one of claims 24 to 29.

31. An inhaler according to claim 30 which is adapted for oral administration as a free-flow powder.

32. An inhaler according to claim 30 which is a metered dose aerosol inhaler.

33. A method for the prevention and/or treatment of a microbial infection comprising the step of administration to a subject in need thereof of an effective amount of the prodrug as defined in any one of claims 1 to 22 or a formulation as defined in any one of claims 24 to 29.

34. A method according to claim 33, in which the microbial infection is a bacterial, viral, fungal, parasitic, yeast or protozoal infection.

35. A method according to claim 34, in which the bacterial infection is a Gram Negative or Gram Positive infection.

36. A method according to claim 35, in which the bacterial infection is associated with the respiratory tract, urinary tract or GI tract or a systemic infection caused by enteric bacteria.

37. A method according to claim 34, in which the viral infection is an orthomyxovirus or paramyxovirus infection.

38. A method according to claim 34 or claim 37 in which the viral infection is an influenza A or B infection, parainfluenza, mumps or Newcastle disease..

39. A method according to any one of claims 33 to 38 in which the administration is to the respiratory tract by inhalation, insufflation or intranasally or a combination thereof.

40. Use of the prodrug as defined in any one of claims 1 to 22 for the manufacture of a medicament for the prevention and/or treatment of a microbial infection.

41. Use of the prodrug as defined in any one of claims 1 to 22 in the prevention and/or treatment of a microbial infection.

42. Use of the prodrug as defined in any one of claims 1 to 22 as an antimicrobial agent.

43. A prodrug as defined in any one of claims 1 to 22 or a formulation as defined in any one of claims 24 to 29 for use in the prevention and/or treatment of a microbial infection.

44. A method for the detection of a microbial infection which comprises the step of contacting the prodrug as defined in any one of claims 1 to 22 or the formulation as defined in any one of claims 24 to 29 with a sample suspected of containing the microorganism.